

The Official Action first objects to the title of the invention as not being descriptive. In response, the title has been corrected herewith and reconsideration is requested in view thereof.

The Official Action notes that Patent numbers 4,755,805 and 4,712,927 listed in the IDS previously submitted in this application are incorrect. The correct patent numbers should be 4,755,865 and 4,772,927. It is noted that the '865 patent was cited by the Examiner and listed on the 892 attached to the Official Action. The '927 patent is listed on a supplemental 1449 attached hereto and the requisite fee for consideration of this reference is attached. Applicant regrets any inconvenience caused by these typographic errors.

The Official Action next objects to claims 21-24 as obvious based on the combination of either (1) Japanese Patent Document 61-100967 to Tsunekawa and U.S. Patent 5,218,214 to Tyson et al. or (2) U.S. Patent 4,755,865 to Wilson et al. and Tyson. Claims 25-33 are rejected as obvious based on either (1) Tsunekawa, Tyson and U.S. Patent 4,822,751 to Ishizu et al. or (2) Wilson, Tyson and Ishizu.

It is noted that in order to establish a *prima facie* case of obviousness, (1) there must be some suggestion or motivation (either in the references themselves or in the knowledge generally available to one of ordinary skill in the art) to combine the reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art references when combined must teach or suggest all the claim limitations. See *MPEP* § 2142-43.

The Official Action asserts that Tsunekawa discloses that at least one of the source/channel boundary region and drain/channel region has a greater band gap than any of said source, drain, and channel regions and that a portion of a region formed by implantation of oxygen or nitrogen is at the source/channel boundary region and at the drain/channel boundary region.

It should be noted, however, that the ion implanted region 2 in Figures 1 and 4 of Tsunekawa is an insulating layer for thinning the thickness of the channel region 4 less than that of source and drain regions 3. Accordingly, the ion implanted region 2 of Tsunekawa does not include any one of the source 3, channel 4, and drain 3 regions, and both the source/channel boundary and the drain/channel boundary (indicated at "A" in the magnified Figures 1, 3, and 4 in *Appendix I*) are located outside of the ion implanted insulating region 2 (see *Abstract*). Therefore, even if Tsunekawa is combined with Tyson, applicant believes that the claimed device cannot be achieved since the combination does not disclose or suggest all of the claim limitations as required to maintain a *prima facie* case of obviousness, such as:

- (1) a boundary region between a channel region and at least one of source and drain regions having a greater energy band gap than any of said source, drain, and channel regions (claim 21);
- (2) the source/channel boundary and drain/channel boundary are located within said impurity doped regions, respectively (claim 22);
- (3) the impurity doped regions are located within said channel semiconductor region respectively adjacent said source/channel boundary and said drain channel boundary (claim 23), and
- (4) the position of the LDD and FDD (claim 24).

Furthermore, it is respectfully submitted that the Official Action has failed to provide a sufficient showing that one of skill in the art would have been motivated to combine the teachings of Tsunekawa and Tyson as set forth in the first prong of the test discussed in *MPEP* § 2142-43 and discussed above. The *MPEP* makes clear that "the initial burden is on the Examiner to provide some suggestion of the desirability of doing what the inventor has done." *MPEP* § 2142 (emphasis added). That is, simply because the references could be combined does not mean that they should be. Accordingly, it is respectfully submitted that an insufficient showing that one of skill in the art would be

motivated to combine the selected portions of Tsunekawa and Tyson has been provided and reconsideration is requested for all of these reasons.

Claims 21-24 are also rejected as obvious based on the combination of Wilson and Tyson. Initially, it is believed that this rejection is overcome for substantially the same reasons as set forth above and reconsideration is requested for at least these reasons. Furthermore, it is noted that the Official Action appears to rely on Wilson to show a boundary region between at least one of the source and drain regions having a greater band gap than any of said source, drain, and channel regions and the boundary regions 42C are doped with either oxygen or nitrogen.

With respect to claims 21 and 24, the Official Action admits that Wilson fails to teach the claimed LDD structure and relies on Tyson for showing this feature. However, it should be noted that Tyson is silent about the FDD structure, recited in claim 24 for example, so that the combination of the LDD and FDD structures is entirely unclear from the combination relied upon in the Official Action.

Accordingly, even if Tyson is properly combined with Wilson, applicant believes the claimed device cannot be achieved since the combination fails to teach both that

(1) the boundary region between a channel region and at least one of source and drain regions has a greater energy band gap than any of said source, drain, and channel regions (claim 21), and ✓

(2) the position of LDD and FDD (claim 24).

Furthermore, with respect to claims 22 and 23, Wilson discloses, as shown in Figure 3, that both the source/channel boundary and drain/channel boundary coincide with the O or N doped region/channel boundaries, respectively (claim 22), and that the O or N doped regions are not located within said channel semiconductor region respectively (claim 23).

Claims 25-33 are directed to the use of the FDD device for driving a pixel of an electro-optical device. Claims 25-33 are rejected as obvious based on the combination

of Tsunekawa, Tyson and Ishizu or the combination of Wilson, Tyson and Ishizu. Since Tsunekawa, Wilson, and Tyson fail to teach the claimed electro-optical device, Ishizu et al. is relied upon by the Official Action for showing this feature. Initially, the above arguments are believed to be applicable here as well and reconsideration is requested first for these reasons. Furthermore, in addition to the above arguments, all of these cited references fail to disclose the doping concentration is at least  $1 \times 10^{19}$  atoms/cm<sup>3</sup> as claimed. Accordingly, even if the cited references can be properly combined as asserted in the Official Action, applicant believes the claimed device cannot be achieved as required to maintain a *prima facie* case of obviousness.

For the reasons set forth above, Applicants now believe that claims 21-33 are in proper condition for allowance. Reconsideration of the outstanding rejections is requested. If the Examiner feels that any further discussions about this case would be beneficial, he is invited to contact the undersigned.

Respectfully submitted,



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